SE441 – Continuous Delivery and DevOps
College of Computing and Digital Media
DePaul University

Term: Winter 2024
Classroom section: Thu 5:45PM – 9:00PM, LEWIS 01513 at Loop Campus
Course homepage: https://d2l.depaul.edu/d2l/home/983582
Drop date (no penalty): Friday, January 19, 2024

Instructor: Steven Engelhardt
Office hours: Thu 4:00PM – 5:30PM, Daley 200B, by appointment
Email: sengelha@depaul.edu

Description

A study of the tools, techniques, and processes used in continuous delivery and DevOps. Students will learn to transform an organization that uses traditional software release methods into one that embraces continuous delivery and deployment. Topics will include: the economics of DevOps and continuous delivery; the role of virtualization, cloud technologies, and containers; automated builds and testing; value stream maps; the essentials of configuration management; effective use of source code control branches and feature flags to manage multiple lines of development; organizational factors affecting the success of continuous delivery and DevOps adoption including: culture, team organization, collaboration, and software development practices.

Prerequisite(s)

CSC 403.

Contacting the Instructor

The best way to contact me is via email at sengelha@depaul.edu. Emails will be returned within 24 hours. If you need to meet with me please either come to regular office hours or email me to set up an alternate meeting time. I do not have access to voice mail on my office phone.

References

Primary

- Jez Humble and David Farley. 2010. *Continuous Delivery: Reliable Software Releases through Build, Test, and Deployment Automation (1st. ed.).* Addison-Wesley Professional.

Secondary

- Nicole Forsgren, Jez Humble, and Gene Kim. 2018. *Accelerate: The Science of Lean Software and DevOps Building and Scaling High Performing Technology Organizations (1st. ed.).* IT Revolution Press.
- Gene Kim, Patrick Debois, John Willis, and Jez Humble. 2016. *The DevOps Handbook: How to Create World-Class Agility, Reliability, and Security in Technology Organizations.* IT Revolution Press.

Lecture notes and supplementary materials may be provided by the instructor.

Learning Objectives

Following this course all students should be able to:

- *Understand the Principles of Continuous Delivery and DevOps*: Students should learn about the key principles, practices, and benefits of Continuous Delivery and DevOps. This includes understanding the culture, mindset, and organizational changes necessary for successful implementation.
- *Master Automation*: Gain proficiency in automating the software delivery process, including continuous integration, continuous testing, and continuous deployment. This involves learning to use various tools and technologies that facilitate automation.
- *Version Control and Configuration Management*: Understand the importance of version control in a DevOps environment and how to manage infrastructure and configuration as code.
- *Containerization and Orchestration*: Learn about container technologies like Docker and orchestration tools such as Kubernetes, and how they are used in a Continuous Delivery/DevOps context.
- *Monitoring and Logging*: Develop skills in monitoring the health of applications and infrastructure, and in using logging for debugging and performance tuning.
- *Security in DevOps (DevSecOps)*: Understand the importance of integrating security practices into the DevOps workflow and learn about automated security testing and compliance.
- *Cloud Computing and Infrastructure as a Service (IaaS)*: Learn about cloud computing models and how IaaS can be leveraged for DevOps practices.
- *Collaboration and Communication Skills*: Develop soft skills critical for effective teamwork in a DevOps environment, including communication, collaboration, and problem-solving skills.
- *Case Studies and Real-World Scenarios*: Analyze case studies of organizations that have successfully implemented Continuous Delivery and DevOps practices to understand practical challenges and solutions.
- *Emerging Trends and Best Practices*: Stay updated with the latest trends, tools, and best practices in Continuous Delivery and DevOps.

Course Outline

The below course outline is tentative and may be subject to change.

Wk	Date	Topics Covered
1	Jan 11	Course Overview; Intro to DevOps; Version Control
2	Jan 18	Continuous Integration (CI); Automating Builds
3	Jan 25	Automating Tests; Continuous Delivery (CD)
4	Feb 1	Infrastructure as Code (IaC); Containers & Orchestration
5	Feb 8	Configuration Management; Deployment Strategies
6	Feb 15	Monitoring, Logging, and Observability
7	Feb 22	Cultural and Organizational Transformation; SRE
8	Feb 29	Security in the DevOps World (DevSecOps)
9	Mar 7	Scaling DevOps; Case Studies; Real-World Applications
10	Mar 14	Emerging Trends; Career Pathways; Course Recaps
11	Mar 21	Final Exam

Grading

Grades in the course will be determined as follows:

Weekly Quizzes (10)	**25%**
Homework Assignments (5)	**50%**
Final Exam	**25%**
Total	**100%**

There is no midterm exam for this class.

Course Policies

Changes to Syllabus

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted under Announcements in D2L and sent via email.

Online Course Evaluations

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Students complete the evaluation online in CampusConnect.

Academic Integrity and Plagiarism

This course will be subject to the university's academic integrity policy. More information can be found at http://academicintegrity.depaul.edu/. If you have any questions be sure to consult with your professor.

Academic Policies

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing as indicated in the University Academic Calendar. Information on enrollment, withdrawal, grading and incompletes can be found at: http://www.cdm.depaul.edu/Current%20Students/Pages/PoliciesandProcedures.aspx

Students with Disabilities

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential. To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted the Center for Students with Disabilities (CSD) at:

Email: csd@depaul.edu
Lewis Center 1420
25 East Jackson Blvd.
Phone number: (312)362-8002
Fax: (312)362-6544
TTY: (773)325.7296